

Interactive comment on “An analysis of offshore wind farm SCADA measurements to identify key parameters influencing the magnitude of wake effects” by Niko Mittelmeier et al.

Anonymous Referee #2

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General comments

This paper presents a new parameterization of stability classes for the prediction of single and multiple wake effects based on met mast and LiDAR data. After reviewing the paper, I am fairly convinced that this line of reasoning is worth pursuing. However, there are some issues to be addressed before the paper can be recommended for publication. These are enumerated below.

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Specific comments

Page 2, line 12 'rotordiameter' is missing a space.

Page 3, fig 2 caption 'cycles' should be 'circles'.

Page 4, lines 11 and 12 There are two instances where 'is' should be 'are'.

Page 4, lines 17 and 18 There are two spelling errors: 'allowes' and 'includes'. Also the possessive is not necessary for 'turbine' and 'nacelle'.

Page 6, section 3.1 It is surprising that a study specifically considering stability effects is relying on a simplified classification technique. This introduces a considerable amount of unnecessary uncertainty as an independent variable (*i.e.* the stability) is not directly measured.

Page 7, table 1 More discussion for the boundary values for TI is needed. How exactly were these values assigned to unstable, neutral, and stable?

Page 7, eq 4 I suspect, but cannot verify, that the decent correlation between the two may be (in part) happenstance. Atmospheric turbulence intensity decreases with wind speed as a result of flow physics. The standard deviation of output power to power also decreases with wind speed but largely because the turbine controller plays an increasingly active role. The authors allude to this later in the paper but more discussion of why eq 4 might be a suitable proxy for eq 1 would be of interest.

Page 7, line 26 Why use the median instead of the mean?

Page 8, line 2 '...the thresholds are selected to achieve the best distinction between the three data sets.' As these thresholds are central to the stability classification (and this work in general), a mathematical definition of *best distinction* must be included. Currently, this work is unreproducible by a third party.

Page 8, line 7 Please avoid use of the word 'prove' in this context.

Page 9, fig 5, bottom left One point just right of the centre for the stable curve is clearly an outlier. Any comment?

Tables 2–5 The large variation in thresholds suggests that the approach is not general and more details regarding how these thresholds are determined is needed.

Page 16, line 19 Why limit the data set to 7–9 m/s? Are these results representative?

Page 17, line 1 'The difference in power production between stable and unstable cases is in the range of 10%.' Stability is only inferred here from TI so the statement should preferably refer to differences between high and low TI conditions.

Page 17, line 8 The paper would be significantly more complete with this range of important wind speeds included in the analysis.

Page 18, line 7 Typo: 'reviled' should be 'revealed'.

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